

CLAIMS

WHAT IS CLAIMED:

1 1. A built-in self-test controller, comprising:
2 a built-in self-test engine capable of executing a built-in self-test and generating an
3 indication of whether the executed built-in self-test is completed; and
4 a built-in self-test signature including the indication.

1 2. The built-in self-test controller of claim 1, wherein the built-in self-test engine
2 is a logic built-in self-test engine and the built-in self-test signature is a logic built-in self-test
3 signature.

1 3. The built-in self-test controller of claim 2, wherein the logic built-in self-test
2 engine comprises:
3 a logic built-in self-test state machine; and
4 a pattern generator.

1 4. The built-in self-test controller of claim 3, wherein the logic built-in self-test
2 state machine further comprises:
3 a reset state entered upon receipt of an external reset signal;
4 an initiate state entered from the reset state upon receipt of a logic built-in self-test run
5 signal;
6 a scan state entered from the initiate state upon the initialization of components and
7 signals in the logic built-in self-test domain in the initiate state;
8 a step state entered into from the scan state and from which the scan state is entered
9 unless the content of the pattern generator equals a predetermined vector
10 count; and
11 a done state entered into when the content of the pattern generator equals the
12 predetermined vector count.

1 5. The built-in self-test controller of claim 1, wherein the logic built-in self-test
2 signature comprises the content of a multiple input signature register.

1 6. The built-in self-test controller of claim 1, wherein the built-in self-test engine
2 is a memory built-in self-test engine and the built-in self-test signature is a memory built-in
3 self-test signature.

1 7. The built-in self-test controller of claim 6, wherein the memory built-in self-
2 test signature includes the results of at least one paranoid check.

1 8. The built-in self-test controller of claim 6, wherein the memory built-in self-
2 test signature includes a bit indicating whether a memory built-in self-test is done.

1 9. The built-in self-test controller of claim 6, wherein the memory built-in self-
2 test engine comprises:

3 a memory built-in self-test state machine; and
4 a nested memory built-in self-test engine operating the memory built-in self-test state
5 machine.

1 10. The built-in self-test controller of claim 9, wherein the memory built-in self-
2 test state machine comprises:

3 a reset state entered upon receipt of an external reset signal;
4 an initiate state entered from the reset state upon receipt of at least one of a memory
5 built-in self-test run signal and a memory built-in self-test select signal;
6 a flush state entered from the initiate state upon the initialization of components and
7 signals in the memory built-in self-test domain in the initiate state;
8 a test state entered into from the flush state; and
9 a done state entered into upon completing the test of each of a plurality of memory
10 components in the memory built-in self-test.

1 11. The built-in self-test controller of claim 9, wherein the memory built-in self-
2 test engine comprises:

3 a plurality of alternative memory built-in self-test state machines; and
4 a nested memory built-in self-test engine operating a predetermined one of the
5 memory built-in self-test state machines.

1 12. The built-in self-test controller of claim 11, wherein each of the memory built-
2 in self-test engines comprises:

3 a reset state entered upon receipt of an external reset signal;
4 an initiate state entered from the reset state upon receipt of at least one of a memory
5 built-in self-test run signal and a memory built-in self-test select signal;
6 a flush state entered from the initiate state upon the initialization of components and
7 signals in the memory built-in self-test domain in the initiate state;
8 a test state entered into from the flush state; and
9 a done state entered into upon completing the test of each of a plurality of memory
10 components in the memory built-in self-test.

1 13. A built-in self-test controller, comprising:

2 means for executing a built-in self-test and generating an indication of whether the
3 executed built-in self-test is completed; and

4 means for storing the results of the executed built-in self-test, including the indication.

1 14. The built-in self-test controller of claim 13, wherein the executing means is a
2 logic built-in self-test engine and the storing means is a logic built-in self-test register.

1 15. The built-in self-test controller of claim 13, wherein the storing means
2 comprises the content of a multiple input signature register.

1 16. The built-in self-test controller of claim 13, wherein the executing means is a
2 memory built-in self-test engine and the storing means is a memory built-in self-test signature
3 register.

1 17. An integrated circuit device, comprising:

2 a plurality of memory components;

3 a logic core;

4 a testing interface; and

5 a built-in self-test controller, including:

6 a built-in self-test engine capable of executing a built-in self-test on one of the
7 memory components and the logic core and storing the results thereof,
8 wherein the results include an indication of whether an executed built-
9 in self-test is completed; and

10 a register capable of storing the results of an executed built-in self-test,
11 including the indication.

1 18. The integrated circuit device of claim 17, wherein the built-in self-test engine
2 is a logic built-in self-test engine and the register is a multiple input signature register.

1 19. The integrated circuit device of claim 17, wherein the built-in self-test engine
2 is a memory built-in self-test engine and the register is a memory built-in self-test signature
3 register.

1 20. The integrated circuit device of claim 17, wherein the memory components
2 include a static random access memory device.

1 21. The integrated circuit device of claim 17, wherein testing interface comprises
2 a Joint Test Action Group tap controller.

1 22. A method for performing a built-in self-test, the method comprising:
2 performing a built-in self-test, including generating an indication of whether the built-
3 in self-test is completed; and
4 storing the indication.

1 23. The method of claim 22, wherein performing the built-in self-test includes
2 performing a logic built-in self-test and storing the indication includes setting a bit in a
3 multiple input signature register.

1 24. The method of claim 23, wherein performing the logic built-in self-test
2 includes:

3 resetting a logic built-in self-test engine;
4 initiating a plurality of components and signals in a built-in self-test controller upon
5 receipt of a logic built-in self-test run signal;
6 scanning a scan chain upon the initialization of the components and the signals;
7 stepping to a new scan chain; and
8 repeating the previous scanning and stepping until the content of a pattern generator
9 in a logic built-in self-test engine of the built-in self-test controller equals a
10 predetermined vector count.

1 25. The method of claim 23, further comprising at least one of:
2 setting a bit in the multiple input signature register indicating an error condition arose;
3 and

4 setting a bit in the multiple input signature register indicating whether the stored
5 results are from a previous logic built-in self-test run.

1 26. The method of claim 22, wherein performing the built-in self-test includes
2 performing a memory built-in self-test and storing the indication includes setting a bit in a
3 memory built-in self-test signature register.

1 27. The method of claim 26, wherein performing the memory built-in self-test
2 includes:

3 resetting a memory built-in self-test engine;
4 initiating a plurality of components and signals in a built-in self-test controller upon
5 receipt of at least one of a memory built-in self-test run signal and a memory
6 built-in self-test select signal;
7 flushing the contents of a plurality of memory components to a known state after
8 initialization of the components and the signals; and
9 testing the flushed memory components.

1 28. The method of claim 26, wherein performing the memory built-in self-test
2 further includes at least one of:
3

4 storing the results of the memory built-in self-test in the memory built-in self-test
5 signature register; and
6 storing the results of at least one paranoid check in the memory built-in self-test
signature register.

1 29. A method for testing an integrated circuit device, the method comprising:
2 interfacing the integrated circuit device with a tester;
3 performing a built-in self-test, including generating an indication of whether the built-
4 in self-test is completed;
5 storing the indication; and
6 reading the indication.

1 30. The method of claim 29, wherein performing the built-in self-test includes
2 performing a logic built-in self-test and storing the indication includes setting a bit in a
3 multiple input signature register.

1 31. The method of claim 29, wherein performing the built-in self-test includes
2 performing a memory built-in self-test and storing the indication includes setting a bit in a
3 memory built-in self-test signature register.

1 32. The method of claim 29, wherein interfacing the integrated circuit device with
2 the tester includes employing Joint Test Action Group protocols.